
University of Colorado at Colorado Springs

Home Work Assignment 1

Out 09/09/2019, Due 09/23/2019

1 Printing Sentences (10 pts)

Write a Java program `PrintSentences.java` that prints *three sentences* about yourself. This can be any fun fact. Each sentence forms a new line on the console. Make sure that the printouts are visible easily.

2 Linear Equations (20 pts)

Given a system of linear equations:

$$\begin{aligned}ax + by &= e \\ cx + dy &= f,\end{aligned}$$

where x and y are unknown, and a, b, c, d are given. The solutions are calculated as

$$\begin{aligned}x &= \frac{ed - bf}{ad - bc} \\ y &= \frac{af - ec}{ad - bc}.\end{aligned}$$

Write a program `LinearEquations.java` that solves the following linear equations and displays the values of x and y :

$$5x + 3y = 1 \tag{1}$$

$$4x - 6y = 2. \tag{2}$$

Please do not prompt the user for the values of a, b, c , and d – declare them as variables and use accordingly.

3 Computing the Distance between Two Points (25 pts code + 5 pts pseudocode = 30 pts)

Write a Java program `DistanceBetweenPoints.java` that prompts the user to enter two points in a 2-D space: (x_1, y_1) , (x_2, y_2) , and displays the distance between them. The distance is calculated as $\sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$. The X and Y coordinates may have decimal points. Print the value of the distance. The user can enter numbers with no decimal digits or any number of decimal digits, but when the program prints the result, it prints it with **3 decimal points**. An example output may look like the following.

```
Enter the first point: 2.1 3.25
Enter the second point: 1 10.005
Distance between the two points: 6.844
```

4 Computing Surface of a Sphere (25 pts code + 5 pts pseudocode = 30 pts)

Write a Java program `SurfaceOfSphere.java` that asks for a floating point number to be entered by the user. The program prints out the surface of the sphere with the user input as its radius. Note that with a radius of r , the surface of a sphere is $4\pi r^2$.

Please declare π as a **constant**. The user can enter a number with any number of digits after the decimal point, but make sure when you print the surface area, print it with **2 decimal points**. An example output may look like the following (your output may be slightly different depending on your precision of π).

```
Enter the radius: 2.125
Surface of the sphere: 56.74
```

Submission

Please save your programs in four Java files, two of which containing **pseudocode** (problems 3 and 4). You may include your pseudocode in a block comment using `/* ... */`. They worth 5 pts each. Another **10 pts are given to your coding style** (comments – summary and in-code comments: up to 4 pts, naming conventions: up to 3 pts, proper indentation/spacing: up to 3 pts). We will run each program several times with our input and verify that the results are correct.

Please place your files (.java files only) in a folder called **hw1-firstname-lastname** and zip it. The zipped file should be named **hw1-firstname-lastname.zip**. Please submit the zipped file to Canvas by the due date.